No. 736,017. PATENTED AUG. 11, 1903.

J. H. REID.

GAS BATTERY.

APPLICATION FILED DEC. 20, 1902.

NO MODEL.

FIG. 1.

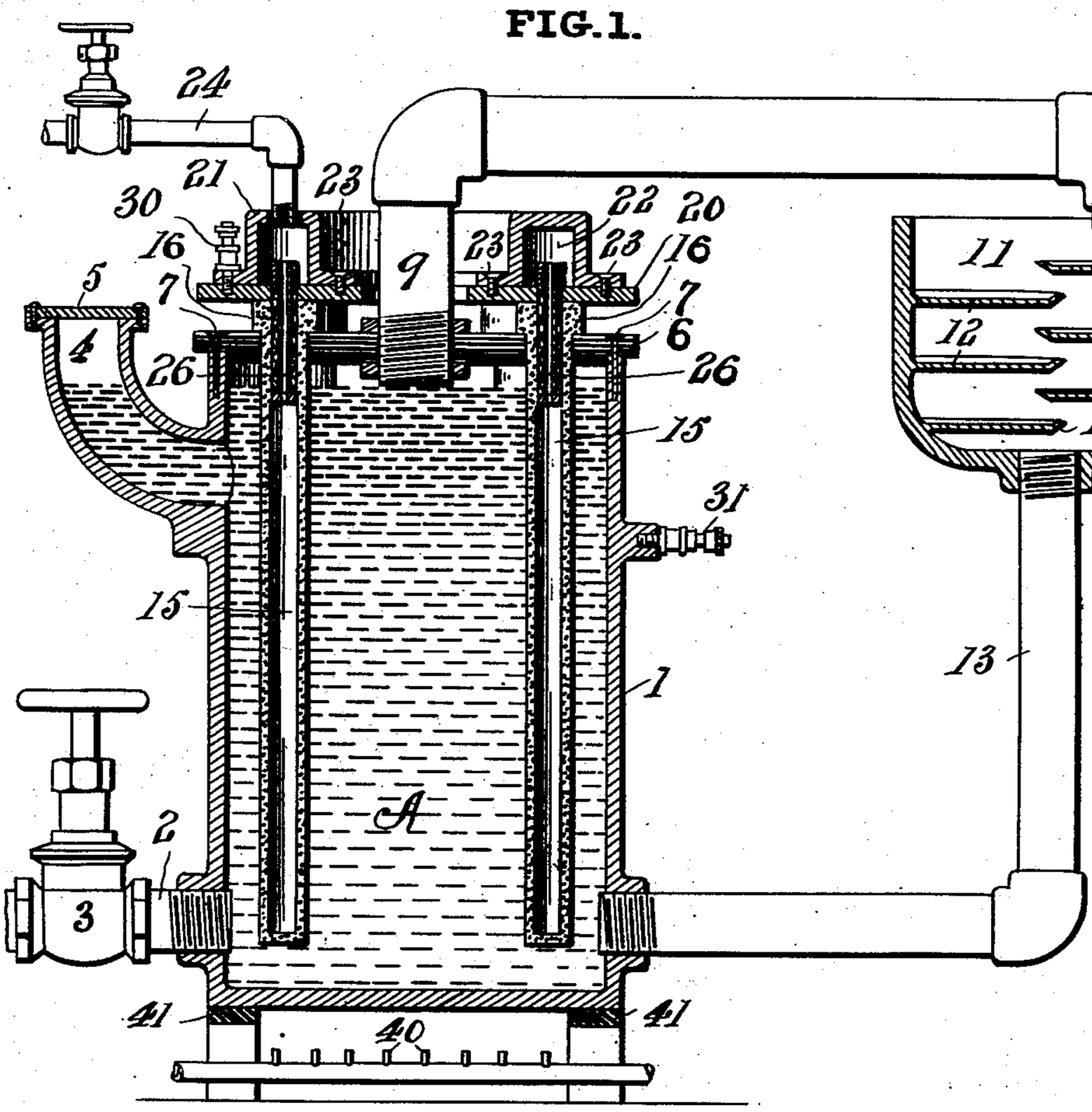
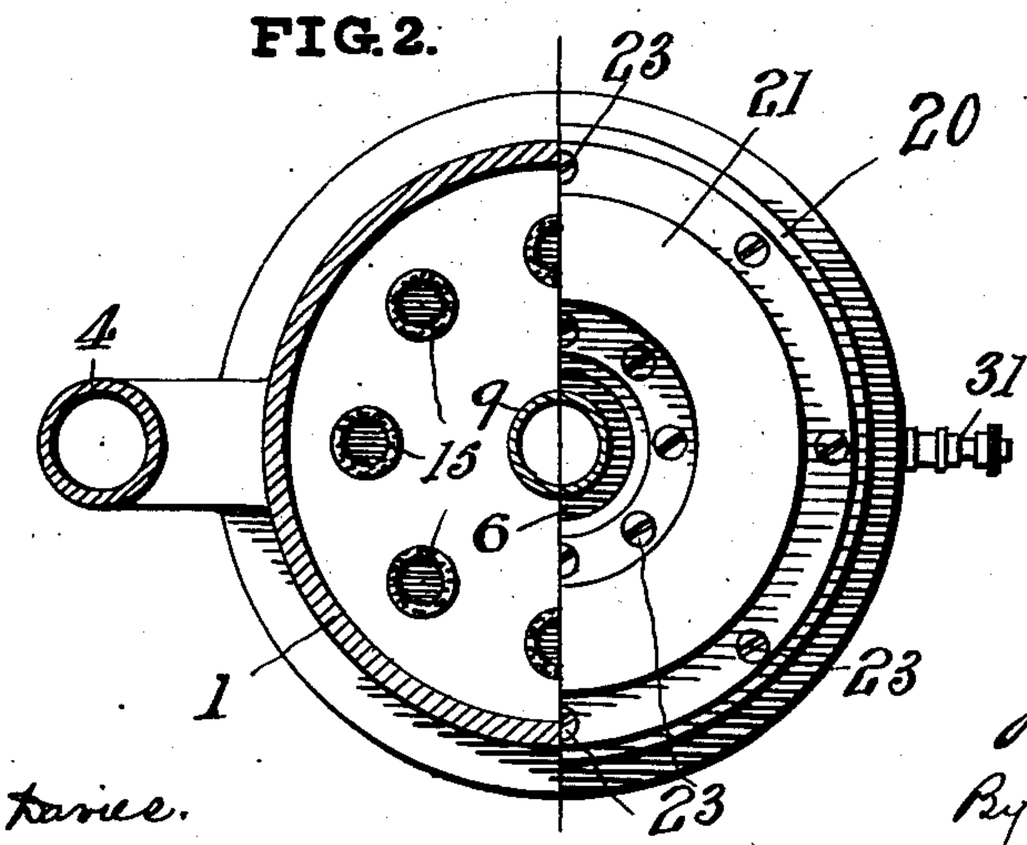


FIG. 2.



Witnesses

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No. 736,017. Patented August 11, 1903.

UNITED STATES PATENT OFFICE.

JAMES H. REID, OF NEWARK, NEW JERSEY.

GAS-BATTERY.

SPECIFICATION forming part of Letters Patent No. 736,017, dated August 11, 1903.

Application filed December 20, 1902. Serial No. 136,037. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. REID, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Gas-Batteries, of which the following is a specification.

This invention relates to gas-batteries or electrical generators wherein gases are brought into intimate relation to produce electric energy.

The object of the invention is to improve the construction of such batteries or electrical generators.

Figure 1 is a central vertical section of an electrical generator, illustrating the present invention, some parts being shown in elevation. Fig. 2 is a plan of the body, partly in section.

The numeral 1 indicates the shell or inclosing casing. This is a generally cylindrical shell of metal, preferably cast metal. A waste or draw-off pipe 2 projects from one side of the shell, and this is provided with a valve or cock 3. At one side near the top of the shell there is a filling and observation passage 4, preferably in form of an elbow with open top. A cover 5 applied to this elbow may be removed for purposes of inspection or to permit the introduction of material into the shell or casing. The top of the casing has a cover 6, which is a non-conductor of electricity and which is capable of enduring a temperature of at least 400° Fahrenheit. What is known in the art as "reconstructed granite" is a good material for the purpose, although other non-conducting material might be used. The cover 6 is preferably held down by screws 7, which enter the top of the casing. Through the center of the cover 6 a pipe 9 extends upward. This pipe has a tightly-sealed joint where it passes through the cover. Above cover 6 pipe 9 turns backward and has a downturned open mouth, as indicated at 10. Under the open mouth 10 there is an open funnel 11, provided with baffle-plates 12, and from the bottom of this funnel a pipe 13 extends downward and communicates with shell 1 near the bottom by means of an elbow and inturned bend.

Arranged around the tube 9 is the non-conducting cover 6, and passing through holes in said cover there are a number of tubes 15, extending through the cover and down into the casing. These tubes are formed of porous carbon and are closed at the bottom. A collar 16 near the top of each tube 15 makes a close joint with cover 6. This joint may be packed or luted in any convenient manner. A metallic ring 20 rests on the top of all the tubes 15 and has a small opening into each tube. An annular metallic cap 21, having a channel 22 therein, is secured to the top of ring 20 by screws 23 or in other suitable manner. This cap 21 forms a close joint with ring 20, so that when gas is forced into the passage 22 through pipe 24 the gas will have no escape from the passage 22 save through the openings into tubes 15. The mouths of tubes 15 where they open into channel 22 through ring 20 will be properly packed by small tubes 26, of asbestos or other suitable material, or in such other manner as may be needed to form gas-tight joints. A binding-post 30 is applied to cover 21 at some point thereof, and the gas-supply pipe 24 is properly insulated, as by having a section of rubber or gutta-percha.

From the foregoing description it should be understood that the porous carbon tubes 15 are entirely insulated from the shell 1. A binding-post 31, connected to the shell 1 at some suitable point, is a convenient means for making electrical connection with the negative element of the battery, and binding-post 30 is a means for connecting with the positive element.

The shell 1 is filled nearly to the top with a material which is an electrolyte. The material which I prefer is a solution of hydrate of sodium or hydrate of potassium. This is to be kept in liquid form when the battery is in use and for the best results should be maintained at a temperature of about 392° Fahrenheit. Such temperature may be maintained by the application of heat to the shell in any usual manner—as, for instance, by flames from gas-burners 40. The shell should be supported on insulators, as 41. When the electrolyte, which contains a considerable amount of oxygen, is heated to the proper tem-

perature and it is desired to develop electrical energy, a fuel-gas is introduced under pressure into the annular channel or chamber 22. This gas is driven down into the porous tubes 15 and percolates through said tubes. Immediately the fluid electrolyte begins to foam or froth, and a portion of the fluid in the form of froth or foam and even in the liquid mass rises in tube 9 and passes over into the funnel 11, being in its passage exposed to external air. The fluid in pipe 13 and funnel 11 does not rise to any considerable extent. The circulation of the fluid electrolyte is in the direction 9 10 11, and in this circulation the electrolyte becomes aerated or oxygenated. A development of electrical energy follows the introduction of the fuel-gas, and by making usual electrical connections at 30 31 the electric current can be conveyed to any place where it is desirable to be used. By increasing the gas-pressure through pipe 24 the circulation of the electrolyte is increased. Any gaseous products of the decomposition and recomposition of the gaseous materials employed can escape from the electrolyte through pipe 9 10.

The funnel 11 serves as a convenient channel for the introduction of water to replenish waste and add to the oxygen of the electrolyte, and it may be used for the introduction of the electrolyte. I prefer the opening at 4 for the latter purpose.

What I claim is—

1. In a gas-battery, a containing-shell which is an electrical conductor, an electrolyte which is liquid at operating temperature inclosed within the shell, a porous tube which is a conductor, in contact with the electrolyte and insulated from the shell, means for forcing gas into said tube, and electrical conductors connected to said tube and shell, all combined.

2. In a gas-battery, a metallic shell, a non-conducting cover therefor, a series of porous tubes supported by the cover and extending into the shell, and a gas-supply pipe connected to the porous tubes, all combined.

3. In a gas-battery, a metallic shell, a non-conducting cover therefor, a series of porous tubes extending through said cover into the shell, and a gas-supply passage communicating with a plurality of said tubes.

4. In a gas-battery, the combination of an inclosing shell, a non-conducting cover therefor, a porous conducting-tube extending through said cover into the shell, and electrical conductors connected to the shell and tube.

5. In a gas-battery, a metallic shell and an electrolyte therein, a cover to said shell, an external receptacle communicating with the shell and having an open mouth, and a pipe extending from near the top of the electrolyte in the shell and leading nearly to the open mouth of said external receptacle.

6. In a gas-battery, a closed shell, an electrolyte in said shell, a porous tube which is an electrical conductor insulated from the shell and in contact with the electrolyte, means for introducing gas into the porous tube, and a passage leading upward from the electrolyte and terminating above a receptacle which communicates with the shell, all combined.

7. In a gas-battery, the combination of the inclosing shell, a plurality of porous tubes extending into the shell, and an annular gas-passage communicating with all the tubes.

8. In an electrical generator a wall or partition sufficiently porous to admit and subdivide gases while excluding liquids, combined with an oxygen-bearing liquid at one face and means for supplying a gas to the other face of said wall or partition and means for heating said oxygen-bearing liquid.

9. A conductor permeable to gases and non-permeable to liquids, means for conducting a gas to one face of said conductor and means for retaining a liquid in contact with the opposite face, a second electrical conductor in contact with the liquid and means for heating said liquid, all combined.

10. In an electrical generator, a porous conductor permeable to gas and non-permeable to liquids, means for supplying a fuel-gas at one face and an oxygen-bearing liquid at the other face of said conductor, and a second conductor at the liquid side of the permeable conductor, and means for heating the liquid, in combination.

11. A stratum of porous carbon (permeable by gas and non-permeable by a liquid) an adjacent stratum of metal, an interposed body of liquid electrolyte, means for supplying a fuel-gas to the dry face of the carbon stratum, and means for heating the electrolyte, all combined.

12. In a gas-battery, a porous conductor, means for conveying gas to one face thereof, a liquid electrolyte in contact with the other face of said conductor, and means for causing a circulation of said electrolyte through the air, so that the electrolyte is aerated.

13. In a gas-battery, a porous conductor, means for conveying gas to one face thereof, a liquid electrolyte in contact with the other face of said conductor, and means for adding oxygen to the electrolyte.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES H. REID.

Witnesses:
W. A. BARTLETT,
M. E. BROWN.